PATENT SPECIFICATION

Application Date: Oct. 10, 1932. No. 28,159/32. 402,918

" " Dec. 13, 1932. No. 35,294/32.

One Complete Left: Dec. 13, 1932.

Complete Accepted: Dec. 14, 1933.

PROVISIONAL SPECIFICATION.

No. 28,159, A.D. 1932.

Improvements in and relating to the Treatment of the Surfaces of Bricks, Building-blocks and the like.

We, JOHN ALEXANDER JOHNSON, of "San Remo", Beverley Road, New Malden, Surrey, of British Nationality, and THE NORBITON POTTERIES AND BRICKWORKS LIMITED, a company organised under the Laws of Great Britain, of Blagdon Road, New Malden, Surrey, do hereby declare the nature of this invention to be as follows:—

This invention relates particularly to a process of applying sand or sand and/or colouring matter to the surfaces of bricks, building blocks slabs or the like, such bricks or the like being known commercially as "semi-dry". Such bricks have surfaces which are hard and incapable of permanently retaining sand or sand and/or colouring matter, so far as we are aware, by any process other than that hereinafter described.

Although the process and apparatus appertaining thereto is especially intended for producing sand and/or colour faced bricks of the type above referred to, it will be understood that bricks of a stiff plastic kind can be treated by the same process and apparatus.

The invention relates, further, to a preferred apparatus for carrying the process into effect and, also to the finished brick, as an article of manufacture.

According to this invention, a brick, building-block or the like is, before being burnt, caused to travel in front of a nozzle or nozzles from which emerges a jet of steam combined with air and sand to which may be added colouring matter, or granulated colouring matter without sand may be used. The steam, being under pressure causes the sand and/or colouring matter to impinge on the surfaces of the brick, whilst admittance of air condenses some of the steam and produces hot vapour which moistens and changes the surface of the brick or the like into a condition which enables the sand and/or colouring matter to be embedded in the surface and therefore be permanently retained therein, and thus produce a superior facing to the brick.

Various apparatus can be employed provided they have the required and properly situated nozzles combined with sources of steam, air, sand and colouring matter and mechanism for carrying the brick in front of the nozzle or nozzles or vice-versa, but apparatus which we prefer to use can be constructed substantially as hereinafter described.

An outer casing has projecting thereinto four suitably situated steam conveying pipes, the respective ends of which enter the base of a preferably conically-shaped mixing chamber having an opening constituting a nozzle.

A sand-conveying pipe enters each mixing chamber, the other end thereof terminating on a ledge and adjacent an opening in a receptacle for sand and/or colouring matter. A sleeve fitted slidingly on the end of the pipe can be adjusted towards or away from sand which accumulates about the opening of the receptacle to regulate the quantity of sand and air which enters the pipe by reason of the vacuum caused by the flow of the steam through the mixing chamber.

A pipe which enters each mixing chamber enables a regulated supply of additional air to be admitted if required, and, at the same time, constitutes an outlet for water which may have accumulated after operations have ceased, the pipe also permits of colouring liquid being drawn into the mixing chamber as an alternative method of applying it.

An endless band, running over pulleys, travels through the casing. Bricks placed on the band and suitably spaced are carried in front of two oppositely disposed nozzles so that the sand or sand and/or colouring matter is projected onto the respective ends of the brick. As the bricks proceed each of them is brought

[Price 1/-]

into contact with a stationary projection in the casing which turns the brick, thus bringing the sides thereof in front of the second pair of oppositely disposed nozzles for treatment.

To facilitate turning of the brick on the band the brick has a pivot on that face of it which is placed on the band, the pivot being situated midway between the end and side edges of the brick and preferably consisting of a semi-spherical protuberance formed during the course of compressing. Alternatively, simple turntables may be secured to the face of the band to support the bricks.

Alternatively, one steam-pipe entering one mixing chamber having one sand-pipe and one air-pipe and four nozzles may be used.

Dated the 8th day of October, 1932.

JOHN A. JOHNSON,
THE NORBITON POTTERIES AND BRICKWORKS LIMITED,
HELENA B. TAYLOR,
Director.
N. JOHNSON,
Director.

PROVISIONAL SPECIFICATION.

No. 35,294, A.D. 1932.

Improvements in and relating to the Treatment of the Surfaces of Bricks, Building-blocks and the like.

We, JOHN ALEXANDER JOHNSON, of "San Remo", Beverley Road, New Malden, Surrey, of British Nationality, and THE NORBITON POTTERIES AND BRICKWORKS LIMITED, a company organised under the Laws of Great Britain, of Blagdon Road, New Malden, Surrey, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in the apparatus described in the provisional specification relating to our copending application for Patent dated the 10th day of October 1932 and numbered 28,159.

In our aforesaid provisional specification is described an apparatus comprising an encasement through which a conveyor belt is adapted to carry bricks, building-blocks, slabs and the like before they are burnt and especially of the type known commercially as "semi-dry", in front of suitably disposed nozzles from which steam, sand and air, or steam, sand, air, and colouring matter or steam air and colouring matter are projected onto surfaces of the bricks and the like before they emerge from the encasement.

It has been found, in practice, that the openings through which the bricks and the like enter and leave the encasement permit a considerable quantity of vapour and sand to escape, thereby wasting sand which could be again used, and effecting discomfort to workmen who may be near the apparatus.

In order, therefore, to prevent the escape of vapour and sand, a small extension or enclosure is provided at each end of the encasement, the end wall of each enclosure having an opening coinciding with an adjacent opening in the end wall of the encasement. Each of the aligned openings have doors or flexible closures which can be raised by the impact of a brick or the like passing through the openings and will automatically close, the arrangement being such that one door of an enclosure closes before the adjacent door opens. Any escape of vapour from the encasement into the enclosures, whilst the inner doors are open, can escape through a flue situated at the top of each enclosure. The doors may consist of flexible sheets of material, such as leather, depending from the upper parts of the openings.

Further, it has been found that sand will accumulate on the upper surface of the lower strand of the conveyor belt and thereby be drawn in between the belt and the surfaces of the pulleys and cause abrasion. In order to prevent such accumulation of sand a protecting plate is provided and is secured to the support which is situated below the upper strand of the belt to prevent sagging thereof. The plate extends between the outer end walls of the extensions of the main casing and may consist of a length of sheet iron bent longitudinally into approximate V-formation. The plate is arranged in such manner that its edges depend below the lower strand of the belt and divert falling sand to each side of it.

Whilst any suitable mixing chamber for the steam, sand, air and/or colouring matter or steam, air and granulated colouring matter, such as that described in our former specification may be employed we now prefer to use a mixing chamber comprising a rectangular hollow

unit into one side of which the steam-pipe enters and extends across the interior to a point adjacent a corresponding outlet which is fitted with an outwardly projecting and removable nozzle. The sand-conveying pipe enters the top of the unit and the drain-pipe extends from the bottom thereof.

Dated the 9th day of December, 1932.

JOHN ALEXANDER JOHNSON,
THE NORBITON POTTERIES AND BRICKWORKS LIMITED,
N. JOHNSON,
HELENA B. TAYLOR,
Directors.

COMPLETE SPECIFICATION.

Improvements in and relating to the Treatment of the Surfaces of Bricks, Building-blocks and the like.

We, JOHN ALEXANDER JOHNSON, of "San Remo", Beverley Road, New Malden, Surrey, of British Nationality, and THE NORBITON POTTERIES AND BRICKWORKS LIMITED, a company organised under the Laws of Great Britain, of Blagdon Road, New Malden, Surrey, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It has heretofore been proposed to apply granulated substances such as sand to the surfaces of bricks and the like to impart to them a soft, warm and rustic appearance, but so far as we have been able to ascertain, the practice has been confined to bricks and the like of a type commonly known as "plastic bricks".

Machines have been proposed for effecting the process of veneering the clay from which bricks are subsequently cut or moulded and comprise a hopper or receptacle to contain the sand, conduits to convey the sand to mixing chambers or junctures with steam-conveying pipes and thence to nozzles which are suitably situated to project the combined steam and granulated substance forcibly onto one or more surfaces of a previously moulded body of clay and travelling on a conveyor belt in front of the nozzles. In one instance of which we are aware, it has been proposed to provide a veneering machine with a shield having a ventilating shaft.

It has also been proposed to project colouring substances onto the plastic clay subsequently to the veneering process by means of steam under pressure.

This invention is confined to bricks of the type commercially known as "semi-dry" bricks which are manufactured from substances which are almost devoid of moisture and are so highly compressed that they are extremely dry and their surfaces too hard to permit of impregnation of sand or the like by steam under pressure without the addition of a large quantity of moisture which, according to this invention, is heated by the admixture thereof with the steam and simultaneously projected therewith onto the brick to temporarily soften its surfaces during the impingement thereon of the sand.

According to this invention, the required quantity of heated moisture is produced either by admitting air to the combined steam and sand so as to condense some of the steam into vapour, or by admitting water or liquid dye to the combined steam and sand in addition to air according to requirement, the mixing devices being specially constructed to produce the necessary commingling.

This invention comprises, further, the admixture with the sand of granulated colouring substances to be applied to the brick simultaneously with the sand and air or sand, air and water before the surfaces dry and harden.

Reference being had to the drawings herewith:—

Fig. 1 is a side view of the entire apparatus, the front side enclosing wall having been removed.

Fig. 2 is a plan, partly in section, the section being taken on the line *x x* of Fig. 1.

Fig. 3 is an end view of Fig. 1.

Fig. 4 is an enlarged side view of a fitting constituting a mixing device for steam, sand, air and colouring matter if used and having a nozzle attached thereto.

Fig. 5 shows part of an endless belt and means which can be used for facilitating turning of the bricks or the like.

Fig. 6 is a cross section of the belt on the line *y y* of Fig. 5.

Fig. 7 shows a brick particularly adapted for treatment in the manner herein described.

On a suitable base 1 is an encasement 2 comprising uprights 3 and side and end walls 4, 5, each of the side walls having openings 6, 7, 8, 9, 10, 11, the openings 6 to 9 permitting inspection of the in-

terior of the encasement. The openings 8 and 9 are preferably fitted with closures 12.

Extensions 13, 14, of the encasement each have a flue 15 and openings 16, 17, opposite openings 18, 19, in the main part of the encasement. These openings have swinging doors or flexible closures 20, 21, 22, 23.

Pulleys 24 on shafts 25 which are journalled and supported in brackets 26 carry an endless band 27 passing through the openings 16, 17, 18, 19, and openings 28 in the end walls of the encasement, the upper strand of the band travelling over a support 29 to prevent sagging thereof. An inverted substantially V-shaped shield 29*a* is secured to the support 29 in such manner that its edges extend below the lower strand of the conveyor belt, the shield extending between the outer walls of the extensions 13—14. One of the shafts 25 may be driven by any suitable means.

A projection 30 on one of the walls of the encasement extends slightly beyond and over one edge of the belt.

Four steam conveying pipes 31 each project into a fitting 32, there being a suitable removable nozzle 33 in alignment with the steam-pipe. A sand conveying pipe 34 which enters the upper part of each fitting extends upwardly through and to the upper surface of a horizontally disposed partition 35, the end of the pipe being fitted with an adjustable sleeve 36. A pipe 37 fitted with a cock 38 enters the lower part of the fitting 32 and has an open end. The fitting may have openings 39 to admit air. The nozzle 33 projecting from each of two of the fittings 32 enter directly into the encasement 2 through the openings 11 at one end thereof, but at the other end of the encasement the fittings are connected with the interior thereof by a hollow flaring attachment 40 entering the openings 11.

A receptacle 41 is situated in the upper part of the encasement and has sloping sides 42 which cause sand in the receptacle to flow towards openings 43, 44, through which the sand falls and forms heaps on the partition 35 and adjacent the sleeves 36 on the sand-pipes.

Various means may be devised for facilitating turning of a brick or the like on the belt and the preferred means consists in forming a rounded or semi-spherical projection 45 on one of the surfaces 46 of a brick, the projection constituting a pivot and, at the same time, raises the surface 46 from close contact with the belt when placed thereon with said surface downwards.

Alternative means may consist of any suitably constructed turn-tables. Such turn-tables might each consist, for example, of a steel disc 47 secured to the surface of the belt, and having a disc 48 revolubly pivoted thereon.

Initially, sand and/or granulated colouring matter is deposited in the receptacle 41 from which it falls through the openings 43, 44, and forms small heaps on the partition 35.

Bricks or the like to be treated are placed on the conveyor belt at A and pass through the opening 16 thereby raising the door or flexible closure 20 which closes before the adjacent closure 21 is raised thereby preventing prolonged escape of vapour. Any vapour which may have escaped into the extensions 14 escapes through the flues 15. As the brick passes the first oppositely disposed nozzles 33 a mixture of combined steam, air and sand and, if desired, colouring matter is projected on to their respective ends. Instead of adding granulated colouring matter as described, liquid dye can be drawn in through the pipe 37 which may also be used for admitting a supply of air in addition to that which enters the pipe 34 with the sand and also through the openings 39. The supply of air or dye can be regulated by the cock 38. As a brick is carried along, one end of it comes into contact with the projection 30 and is thereby turned about so as to present its respective sides to the second pair of nozzles from which they receive treatment as before described with reference to the first pair of nozzles. Inasmuch as it is essential that the nozzles be disposed at a suitable distance from the surfaces of the brick which are under treatment, those nozzles which operate on the ends of the brick are removed a greater distance therefrom than those which project a spray on to the sides of the brick this provision being effected by the attachments 40. The brick then passes on through the openings 19, 17, the flexible closures 19, 23, operating as described with reference to the doors 20, 21.

The quantity of sand to be used can be regulated by moving the sleeves 36, on the sand conveying pipes 34, nearer towards or away from the sand heaps, and the accumulation of sand which does not adhere to the bricks can be periodically removed through any suitable opening in the lower part of the encasement. Water, due to condensation after working has ceased, can be drained off through the pipe 37.

The shields 29*a* prevent the falling sand from depositing on the lower strand of the conveyor belt and being thereby carried between it and the surfaces of the

pulleys and setting up abrasion.

Inasmuch as bricks and the like will sometimes crack, on one or more surfaces after treatment such bricks or the like may be rendered unfit for use when only one or two surfaces thereof have been treated. Therefore the advantage of having four of the surfaces treated in the manner described will be appreciated.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A process of treating the surfaces of bricks, building-blocks and the like of the type commercially known as "semi-dry" by subjecting said surfaces to an impingement of steam sand and air, or steam sand air and water before the bricks are burnt.

2. The addition of colouring matter to the sand for projection therewith onto the bricks or the like according to the process claimed in claiming clause 1.

3. The addition of liquid dye to the admixture of steam sand and air used in the process according to claim 1.

4. Apparatus when used for effecting the process according to claim 1 comprising mixing devices which are such that they will mix steam sand and air or steam sand air and water or liquid dye and are fitted with nozzles from which the admixtures are projected.

5. Apparatus when used for effecting the process according to claim 1 comprising an encasement having a receptacle for sand or sand and colouring matter, combined with a horizontally disposed partition onto which the sand gravitates and from which it is drawn for use: extensions of the encasement each having an opening corresponding to one of two openings in the encasement and swinging or flexible doors in the respective openings in the encasement and extensions thereof; a conveyor belt adapted to travel through the encasement and having a support beneath the upper strand of the belt: a shield secured to the support to protect the belt from sand: steam, sand and air conveying pipes: means for effecting admixture of steam sand and air or steam sand air and colouring matter: means for admitting liquid dye to the mixing device: and means for turning a brick, building-block or the like on the conveyor belt.

6. Apparatus according to claims 4 and 5 in which means for regulating the quantity of sand or combined sand and air to the mixing device consists of a sleeve slidable over and adjustable on the intake end of the sand conveying pipe and adapted to operate as described.

7. Apparatus according to claims 4 and 5 having means whereby liquid dye can be alternatively used according to claim 3 in the manner described.

8. A brick, building-block or the like of the type known as "semi-dry" of which surfaces have been treated by a process according to claims 1 to 3.

9. A brick, building-block or the like, known as "semi-dry" according to claim 8, of which four of its surfaces have been treated according to claims 1, 2, or 3.

10. A brick, building-block or the like having an approximate semi-spherical projection on one of its faces to enable its surfaces to be treated according to claim 9 and by apparatus according to claims 4 and 5.

11. The process of treating the surfaces of bricks, building-blocks or the like of the type known as "semi-dry" substantially as herein before described.

12. Apparatus when used for effecting the process claimed in claims 1 to 3, as herein before described and illustrated in the accompanying drawings.

Dated this 9th day of December, 1932.

JOHN ALEXANDER JOHNSON,
THE NORBITON POTTERIES AND BRICKWORKS LIMITED,
N. JOHNSON,
HELENA B. TAYLOR,
Directors.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1933.

Fig. 1.

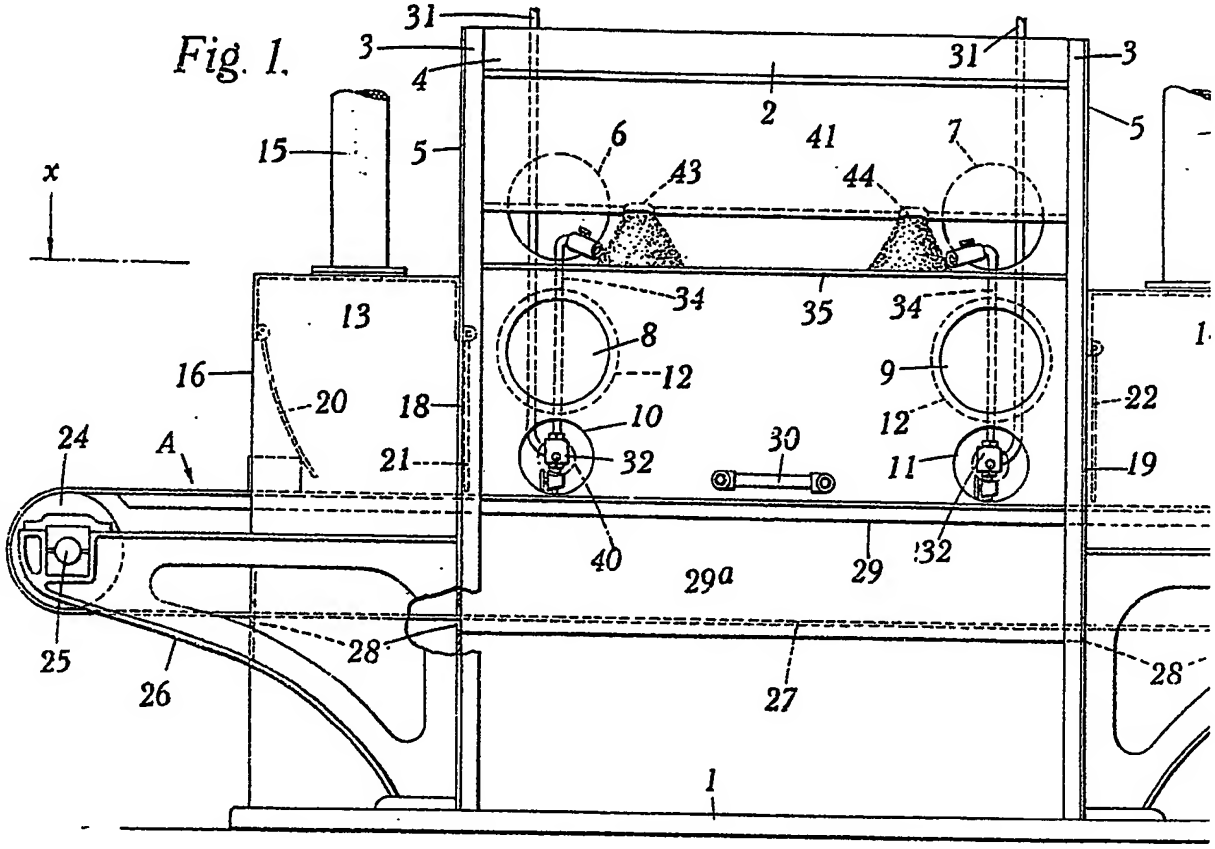


Fig. 2.

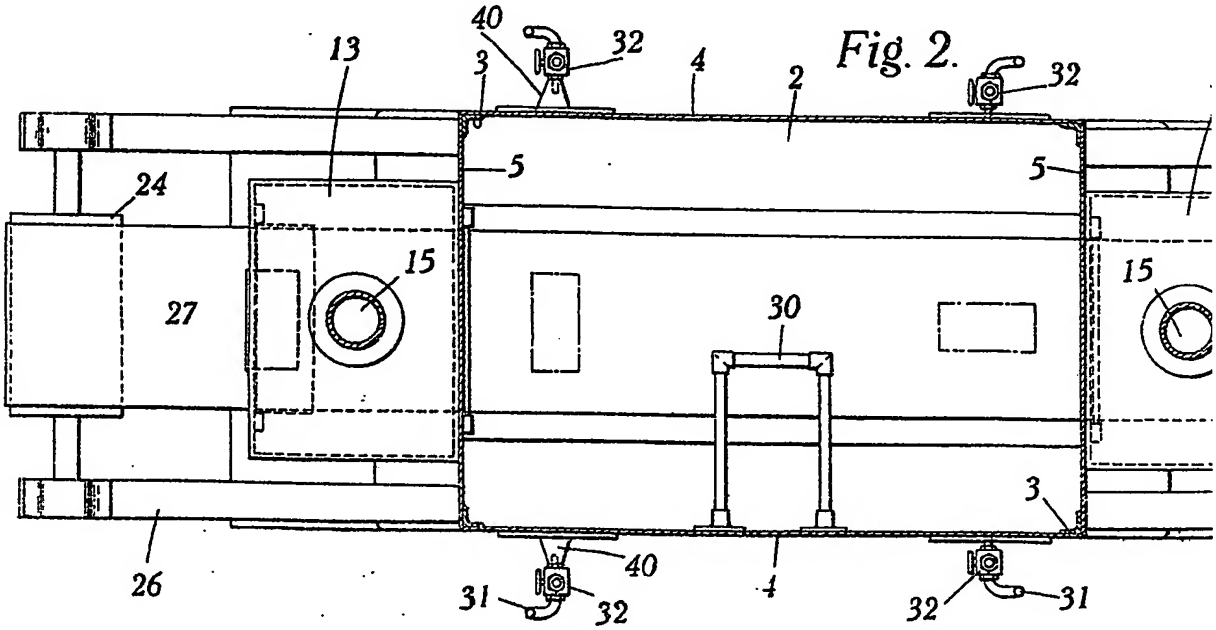


Fig. 3.

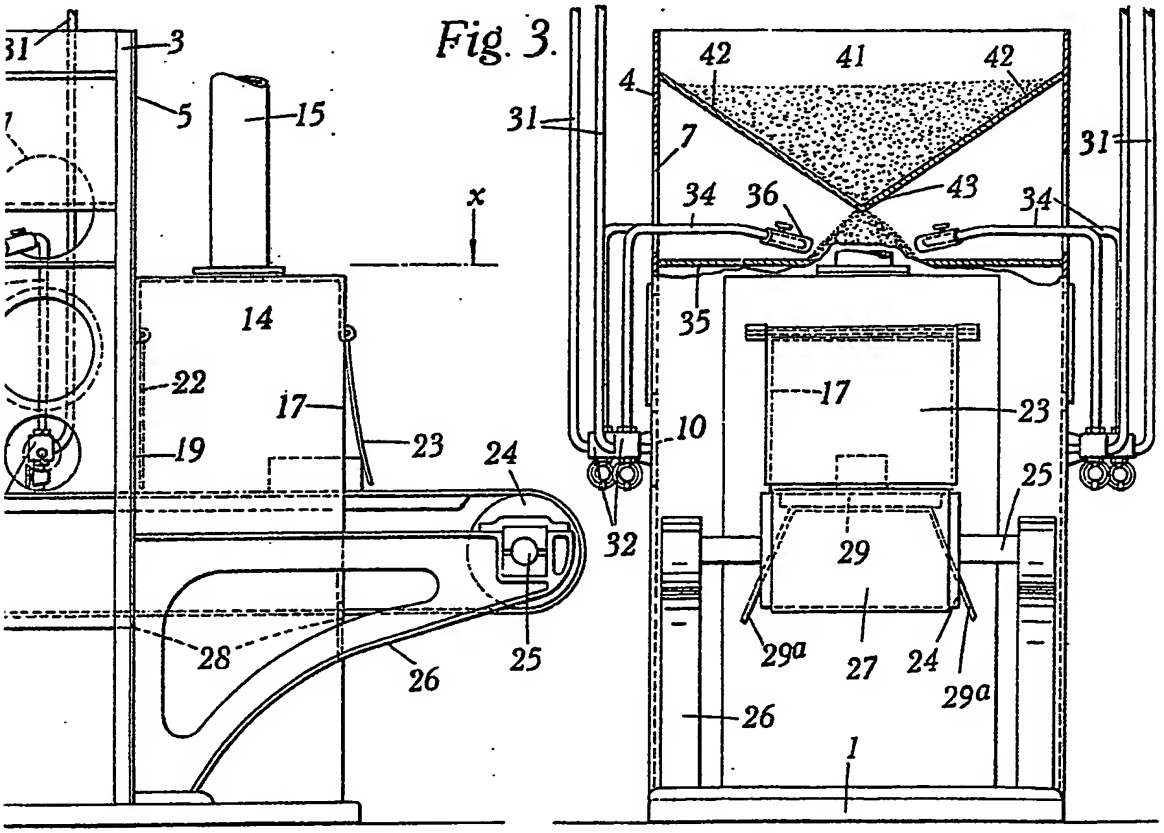
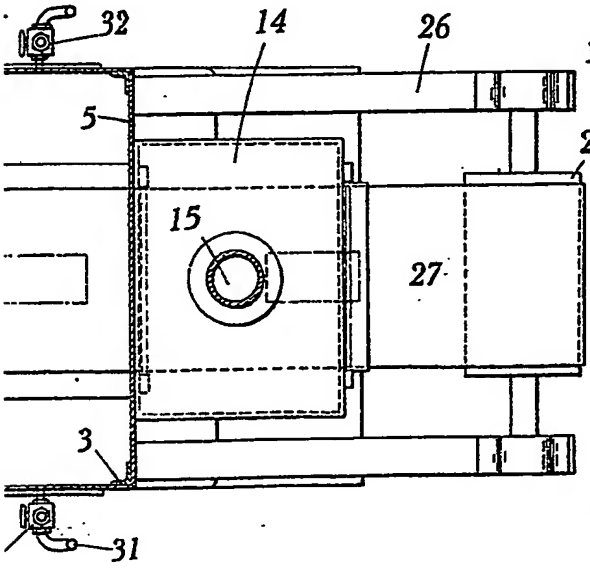


Fig. 4.



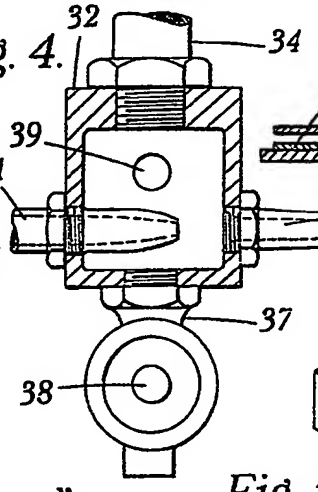


Fig. 6.

Fig. 7.

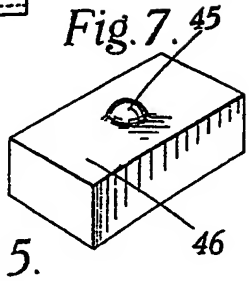


Fig. 5.

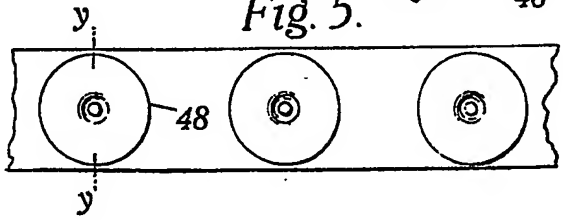


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Fig. 1.

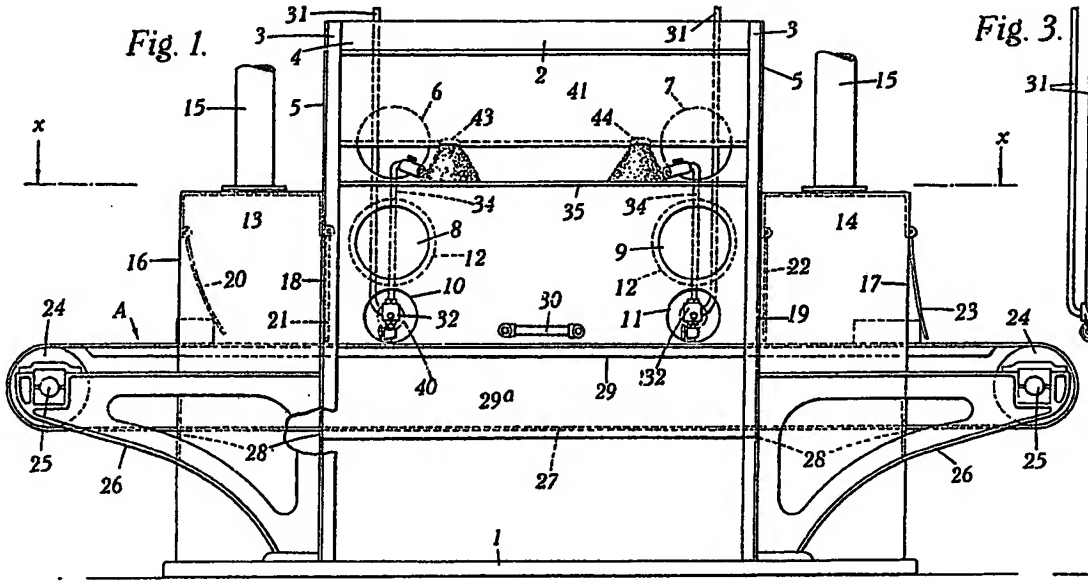


Fig. 3.

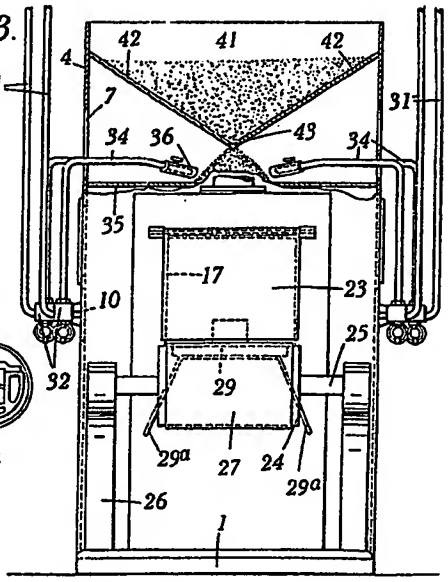


Fig. 2.

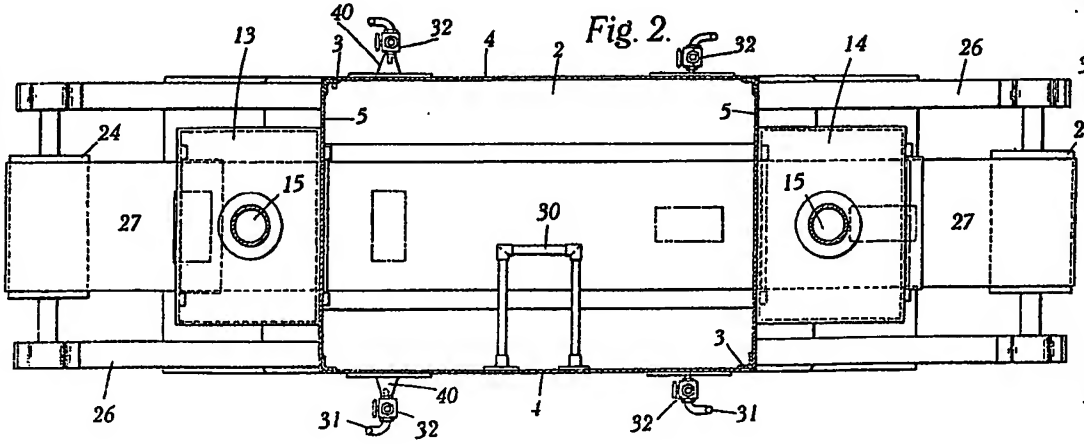


Fig. 4.

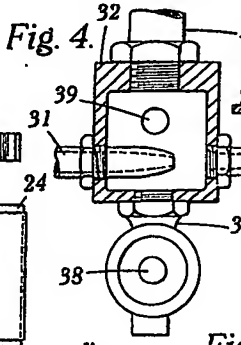


Fig. 6.

Fig. 7.

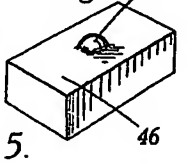
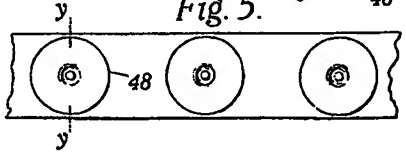


Fig. 5.



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